The Environmental Industries Market in China

February 2001

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The Environmental Industries Market in China

February 2001

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THE ENVIRONMENTAL INDUSTRIES MARKET IN CHINA

Team Canada Inc • Équipe Canada inc

EXECUTIVE SUMMARY

China's past two decades of rapid economic growth, urbanization and industrialization have been accompanied by the steady deterioration of the environment. Given that 80% of China's medium-to-large cities have yet to build municipal wastewater plants, treatment of urban domestic sewage is an important priority. Other priorities include urban domestic solid waste treatment equipment, equipment to reduce carbon dioxide and nitrogen oxide emissions, automotive exhaust reduction equipment, and environmental monitoring equipment. While China's domestic industry includes some strong companies, most are small and do not possess the most current technology. The Chinese environmental market is predicted to reach approximateiy $10 billion[1] in 2001 and holds significant potential for Canadian environmental companies.

As a result of the perceived high potential of the market, there is a great deal of competition from firms from Japan, Europe and the United States. Local firms, while often not possessing the most advanced technology, can compete effectively on price. It is important, therefore, for Canadian exporters to demonstrate to potential customers how the additional features of a given technology will allow the customer to better meet local environmental standards.

There are no specific market access issues in China, however companies should be aware of the advantages of having a local partner and the importance that the Chinese government attaches to local production. It is crucial for Canadian companies to be creative and flexible in financing projects, and to adapt their products to different end users.

In addition to the large financial contributions coming from the World Bank and the Asian Development Bank (AsDB), the Chinese government is spending an ever-increasing share of the gross domestic product (GDP) – now more than 1% -- on environmental projects.

In November 1998, Canada and China signed a framework statement for Co-operation on Environment. The Statement is intended to provide a framework for further bilateral collaboration in sustainable development and environmental technologies.

[1] All monetary amounts are expressed in Canadian dollars, unless otherwise indicated. The conversion rate to Canadian dollars is based on IDD Information Services, *Tradeline*, January 2000.

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THE ENVIRONMENTAL INDUSTRIES MARKET IN CHINA

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MARKET OVERVIEW

Environmental degradation is a difficult and costly problem in China. It is estimated that the cost of environmental degradation and resource scarcity amounts to approximately 8% to 12% of China's GDP, or about $115 billion; while 1998 spending on environmental protection accounted for only 1.02% of its GDP, or $14 billion.

In recent years, there has been a real shift in public attitudes to environmental protection. Despite this shift and the high economic cost of environmental degradation, limited financial resources have forced the Chinese Government to address the problem on a selective basis. Commonly known as the 3-3-2-1 policy, this forms part of China's economic development policy under 9th Five-year Plan (1996 to 2000), and centres around China's efforts to clean up three lakes (Tai, Chao and Dianchi), three rivers (Huai, Hai and Liao), two acid rain control zones and one city (Beijing).

A system of pollution control programs and institutional networks for environmental protection is now in place at the national and local levels. As part of the 1998 government reorganization, China's environmental agency, the State Environment Protection Agency (SEPA)[2], was upgraded to full ministerial rank. The regulatory framework for environmental protection is comprehensive, with legislation covering water, air, solid waste, noise and marine pollution, along with a wide range of other regulations enacted in the 1980s and 1990s. However, enforcement of these regulations remains problematic as laws established by the central agency are enforced by local governments, which are often reluctant to shut down or fine industries which create employment and from which they earn a profit.

According to SEPA officials, by the end of 2000, the proportion of enterprises meeting standards for discharge of industrial wastewater will reach 75.4%, the proportion meeting standards for discharge of industrial flue gases and dust will reach 75.9% and the rate of comprehensive utilization of industrial solid wastes will reach 46.2%. The U.S. Department of State estimates that the Chinese market for pollution control equipment was $7.2 billion in 1999, the majority of which was supplied by imports.

[2] For contact information regarding key organizations mentioned in this report, see **Key Contacts**.

Table 1. Chinese Market for Pollution Control Equipment ($ million)

	1997	1998	1999
Local Production	1993.8	2670.7	3342.8
Exports	52.6	74.1	96.6
Imports	2838.4	3400.6	3937.1
Total Market	4779.6	5997.2	7183.3

Source: U.S. Department of State. *FY 2000 Country Commercial Guide: China* , July 1999.

Key Factors Shaping Market Growth

Water and Wastewater Treatment

Water supply and wastewater treatment are now top priorities of China's environmental protection and infrastructure development policies. Water shortages, caused by uneven geographical distribution, inefficient use, and pollution, affect about 300 cities in China. According to the Ministry of Water Resources, there is an annual gap of 30 to 40 billion cubic metres between water supply and domestic demand. Lack of potable water is due to shortcomings of the present system including the phenomenal growth in industrial development over the past two decades, lack of enforcement of environmental standards, ineffective treatment of industrial effluents, and inadequate investments in infrastructure.

In 2000, most of northern China and part of southern China has suffered the most severe drought in a decade, leading to a drinking water supply crisis for more than 27 million people and 20 million head of livestock. Close to 90% of urban drinking water sources have been polluted to some degree.

Table 2. Chinese Market for Water Treatment and Supply ($ millions)

	1997	1998 (est.)	1999 (est.)	Growth Rate for 2000-2001
Local Production	1187	1684.8	2274.4	35%*
Exports	negligible	negligible	negligible	
Imports	593.5	722.1	974.8	35%
Total Market Size	1780.5	2406.9	3249.2	35%

*estimate for projected Chinese export and local production growth not confirmed
Source: U.S. & Foreign Commercial Service and U.S. Department of State. *China: Water Treatment and Supply*, June 1, 1998.

One of the largest constraints to growth in the Chinese water market is the lack of market pricing for water. High government subsidies for water have meant that water is

supplied to consumers at a loss, particularly when supplied for irrigation. The result is a lack of return on investments in water projects for both local and foreign investors. A change to market water prices will provide opportunities in the water treatment market.

A 1995 ruling by the Ministry of Foreign Trade and Economic Co-operation (MOFTEC) that bans any foreign or foreign-invested joint venture from owning or operating water distribution networks complicates investment in water projects. Due to the ban, the foreign-invested company has to sell the water treated in bulk to the municipal/local government. A further drawback to the ruling is that the local government has little or no incentive to increase the efficiency of distribution or even implement higher water fees to recoup the investment because they are "monopoly buyers."

In 1999, the first water treatment build-operate-transfer (BOT) pilot-project in Chengdu, Sichuan was approved. This is the third BOT project in China — the first two were in the energy sector. This project is for a water treatment plant with a capacity of 400 000 tonnes per day, a 400 000 tonnes per day wastewater treatment plant and an 800 000 tonnes per day intake project. It also includes 27 km of pipeline. Vivendi (France) won the 18-year contact for the project and is in a joint venture with Japan's Marubeni Company. The project is being financed by the AsDB and the European Investment Bank — both provided a $40 million direct loan. The water works project is expected to be completed in 2002.

Table 3. Chinese Market for Wastewater Treatment Technologies ($ millions)

	1997	1998 (est.)	1999 (est.)	Growth Rate for 2000-2001
Local Production	1892.7	2304.8	2884.9	25%*
Exports	negligible	negligible	negligible	
Imports	950	1536.5	1923.2	25%
Total Market Size	2867.7	3841.3	4808.1	25%

*estimate for projected Chinese export and local production growth not confirmed
Source: U.S. & Foreign Commercial Service and U.S. Department of State. *China: Wastewater Treatment Technologies*, June 1, 1998.

Increased industrialization over the past two decades combined with an ageing and strained infrastructure has led to the rapid expansion of the wastewater treatment market. While a draft amendment to the 12-year-old Water Law (1988) is now under discussion, in 1996, the Clean Water Law was updated, requiring all cities with populations of over 250 000 to build a wastewater treatment plant. Presently in urban areas, less than 20% of waste is treated. However, according to SEPA, there is no deadline for reaching the goal, nor has there been any enforcement of this requirement.

China's efforts under the 9th Five-Year Plan to clean up three lakes (Tai, Chao and Dianchi) and three rivers (Huai, Hai and Liao), have achieved some positive results, although water pollution remains a serious problem. According to a report released by SEPA in July 2000, of the 5148 heavily polluting plants that had a daily discharge of wastewater exceeding 100 tonnes into the "three river and three lake" basins, 3540 plants (68.8%) had completed water treatment tasks to improve water conditions. Of the remaining plants, 1073 (20.8%) were closed down or went bankrupt, 415 (8.1%) are in the process of upgrading their pollution treatment methods, and 120 plants (2.3%) have yet to begin treatment work. The main problems in improving water quality in the "three rivers and three lake" basins are as follows:

- inconsistent application of pollution standards and illegal dumping of pollutants; and
- slow progress in the construction of wastewater treatment plants (there are only 28 operational water treatment plants in the area and the construction of 131 new plants has yet to begin).

Air Pollution Control

In 1997, more than 1 million premature deaths were attributed to air pollution in China. Although vehicle emissions are an increasing concern, the majority of China's air pollution problems stem from the country's heavy dependence on soft, high-sulphur coal for power generation and industrial use. Coal-fired electric power plants account for 49.2% of industrial particulate emissions and 43.3% of SO_2 discharges.

In 1995, the government introduced the revised *Air Pollution and Prevention Control Law* and in 1998, an Acid Rain Control Zone and a sulphur dioxide (SO_2) Control Zone were created. New construction projects in these zones must use low sulfur coal, or be equipped with desulphurization and particulate control equipment. Existing industries must switch to low-sulfur coal and/or adopt other measures to reduce emissions of particulate and SO_2 discharges. The deadline for compliance is 2010.

It is anticipated that increased demand for high-technology air pollution control equipment will open up new opportunities for foreign competitors. Widespread demand for flue gas desulphurization equipment, electrostatic precipitators, coal cleaning and combustion technologies, environmental monitoring equipment and nitrogen oxides (NO_x) will increase potential opportunities for Canadian companies.

Table 4. Chinese Market for Industrial Air Pollution Control Equipment ($ millions)

	1997 (est.)	1998 (est.)	1999 (est.)	Growth Rate for 2000-2001 (est.)
Local Production	208.9	267.4	334.3	25%
Exports	6.7	6.8	7.1	1.5%
Imports	74.2	148.6	303.1	50%
Total Market Size	276.4	409.2	630.3	50%

Source: U.S. & Foreign Commercial Service and U.S. Department of State. *China: Industrial Air Pollution Control Equipment*, June 1, 1998.

China has placed great emphasis on the development of the vehicle industry, with annual growth rates reaching 22% during the 1990s. The number of vehicles is expected to rise from 12 million in 1997 to 49 million in 2010. There has been a substantial rise in air pollution due to the increased number of vehicles and consequent rise in fuel consumption. In Beijing, Shanghai, Tianjin and Guangzhou, vehicle emissions account for up to 60% of total air pollution. In 1999, annual emission of carbon monoxide (CO) from vehicles in China was over 9.3 million tonnes and NO_x emissions reached 980 000 tonnes in Chinese cities. Discharge levels of domestic vehicles are five to ten times higher than in developed countries, largely due to the use of older technology.

In an effort to cut down on auto emissions, the Chinese government has issued more stringent regulations and placed more emphasis on enforcement. Some of the new regulations and standards are as follows:

- As of January 1, 2000 all locally produced and imported automobiles must be equipped with an electronic fuel-injection system and auto emissions control equipment.
- Vehicle scrap standards have been put in place to determine a system for disposal of vehicles. These standards stipulate that vehicles that cannot meet National Emissions Standards must be scrapped.
- SEPA is developing stricter vehicle emissions standards based on European standards and more emphasis will be placed on enforcement.
- Local governments have been encouraging the use of liquefied petroleum gas (LPG) to replace gasoline in vehicles. Pilot projects have been set up in Beijing, Shanghai, Shenzhen, Harbin, Chengdu, Guangzhou, and Xi'an.

- The use of CFC-12 in vehicle air-conditioning systems was discontinued in 1999 and vehicle manufacturers now tend to use 134a (1,1,1,2-tetrafluoroethane), as recommended by the State Machine Building Industry Bureau.

Table 5. Chinese Market for Vehicle Emissions Control Technology ($ millions)

	1999 (est.)	2000 (est.)	2001 (est.)	Growth Rate for 2002-2003 (est.)
Local Production	111.4	326.9	416	22%
Exports	negligible	negligible	negligible	
Imports	12.2	274.9	401.1	16%
Total Market Size	123.6	601.8	817.1	16%

Source: U.S. & Foreign Commercial Service and U.S. Department of State. *China: Vehicle Emissions Control Technology*, January 1, 1999.

The market for vehicle emission control technology is estimated to reach $817 million in 2001 and is expected to grow by 16% in 2002 and 2003. Just under half of the market is supplied by imports.

Best sales prospects include catalytic converters, especially those using rare earth such as La and Se as oxidation catalysts (which are cheaper than three-way converters); electronic fuel injection systems, fuel evaporation control systems; retrofit technologies especially for carburetors; and emissions detecting instruments.

Solid Waste Management

Although it has received much less attention than water and air pollution, the demand for solid waste treatment is on the rise. Annually, about 110 million tonnes of municipal solid waste, 650 million tonnes of industrial solid waste and 30 million tonnes of hazardous solid waste are produced.

SEPA has completed a final review of the *Implementation Guidelines to the Law on Solid Waste Pollution Prevention and Control*. It is expected that the State Council will include implementation guidelines on solid and hazardous waste treatment and disposal. Local governments have, in the past, set their own standards for solid waste treatment and disposal, however many are not as stringent as the new national standards and must be upgraded.

Although solid and hazardous waste management legislation was put in place in 1996, there has been little enforcement of standards. Lack of enforcement has been a deterrent to the development of a local solid waste industry and end-users often look to foreign companies for waste management technology. It is expected that the market for solid and hazardous waste treatment equipment, services and technologies will grow as enforcement efforts are stepped up. Demand will also increase due to the fact that locally produced equipment and technologies are often of a lower quality.

Table 6. Chinese Market for Solid Waste Management Technologies ($ millions)

	1998 (est.)	1999 (est.)	2000 (est.)	Growth Rate for 2001-2002 (est.)
Local Production	103.9	111.4	126.3	12%
Exports	negligible	negligible	negligible	
Imports	148.4	175.3	208	18%
Total Market Size	252.3	286.7	334.3	15%

Source: U.S. & Foreign Commercial Service and U.S. Department of State. *China: Solid Waste Management Technologies*, July 1, 1999.

Industrial solid wastes, coal refuse, slag and coal ash account for 50% of all industrial solid waste in China. Other industrial waste sources include: tailings (30%); smelting waste (10% to 11%); chemical waste residues (3.7% to 4.5%); and radioactive wastes (0.3% to 0.5%).

Hazardous waste makes up approximately 2.5% of total industrial waste. About one third of this waste is disposed of without any treatment. Shenzhen currently has the only standardized hazardous waste facility in China, although others are being built in Jilin, Wuxi and Shenyang.

Urban domestic waste has reached 120 million tonnes a year and is growing at an average annual rate of 9%. In some larger cities, including Beijing and Shanghai, the rate of growth reaches 15% to 20%. Inorganic waste accounts for 60% of total urban domestic waste; organic waste, 31% to 36%; and waste from discarded products, 4% to 6%. The volume of plastic waste is on the increase and styrofoam food containers and plastic bags are causing a serious "white pollution" problem.

China disposes of its waste using three main methods: landfill (70%), high-heat compost (20%) and incineration (10%). Shenzhen has two solid waste incinerators: one has a capacity of 450 tonnes daily, the other 300 tonnes daily.

There is a high demand for urban waste collection and transfer vehicles, auxiliary equipment and technology for landfills, incineration equipment, recycling equipment, and composting technology and related equipment.

China's Accession to the World Trade Organization

China has made a number of trade-related commitments to World Trade Organization (WTO) members that are expected to take effect when China accedes to the organization. These include tariff concessions as well as commitments to apply WTO rules relating to: subsidies, standards, intellectual property, import licensing, trade-related investment measures and sanitary and phytosanitary measures. China will also be bound by fundamental WTO principles that will require the country to strengthen commercial legal procedures and improve transparency.

China's WTO commitments should help to reduce the risk of doing business in China and encourage increased trade and investment flows. However, most commitments will be phased in over time. In the case of lower tariff rates, most new bound rates will be phased in over five equal, annual increments from the date of accession.

China negotiated a number of tariff rate concessions in its bilateral WTO agreements with member countries. The most favourable concession for any item will apply to all member countries once China joins the WTO.

Regional Environmental Concerns

Northeast China

Northeast China comprises the three provinces of Liaoning, Jilin and Heilongjiang, and has a population of over 100 million people. This region borders Inner Mongolia, Russia and North Korea, with access to the Yellow Sea, the Bohai Sea and the Sea of Japan. Northeast China is rich in natural resources – particularly coal, oil and gas, forestry and agriculture. It is also a traditional medium and heavy industrial base, with most enterprises being state-owned. In recent years, the region's industrial economy has been affected by structural reforms of state-owned enterprises (SOEs), which have aimed to rationalize operations by improving efficiency, introducing new technology and achieving profitability. One unfortunate but unavoidable consequence of this policy has been that many enterprises have either closed or laid off large number of employees.

In a decision to control growing industrial pollution following 18 years of high economic growth, the central government vowed four years ago to close down all the polluting industrial firms that failed to meet industrial pollution discharge standards by the end of 2000. Statistics show that by the end of June 2000, 82% of the 13 800 firms in Liaoning had met the standards, while 73% of the 5600 firms in Jilin, and 75% of the 2900 firms in Heilongjiang were up to standards.

To meet the challenges of SOE reform, provincial governments have sought to attract foreign investment and technology as a way of diversifying their industrial base. These policies have met with mixed results and the reform process is still under way. The dynamic city of Dalian is a leading example in the region of successful adaptation to market forces.

Liaoning Province

Liaoning is a key industrial base in China and is home to one tenth of China's medium and large SOEs. As the central government implements its policy of SOE reform, Liaoning will continue to struggle with the devastating consequences of massive layoffs and restructuring which have had an impact on the province in recent years. Senyang and Anshan, as centres of heavy industry, have been particularly hard hit. Liaoning's main industrial products include iron, steel, crude oil, processed oil products, cement, plate glass and machinery. Key industries include metallurgy, machinery, petroleum, chemical and building materials.

As of December 1999, the province had shut down 426 polluting industrial firms and banned the use of 98 kinds of obsolete technology. In March 2000, the province levied a $0.06 tax on each tonne of tap water used across the province. The money collected through the tax will used to build wastewater treatment plants.

Canadian companies with expertise in industrial wastewater treatment and air pollution control will find opportunities in Liaoning Province.

Bohai Rim

Beijing

Like most other large Asian cities, Beijing suffers from chronic air pollution, particularly from heavy industry, vehicle emissions and the use of low-grade coal for cooking fuel and heat. By SEPA's admission, seven of the world's 10 most polluted cities are in China, and Beijing is the third most polluted city worldwide. Despite concerted efforts in recent years, the air quality in Beijing remains poor and pollution levels continue to be widely under-reported.

Improving Beijing's air quality was identified as a priority in the 9th Five-year Plan, and will remain a priority for the 10th Five-year Plan (2001-2005). The municipal government has introduced various measures to address the problem of air quality, including upgrading boilers, promoting the use of cleaner-burning low-sulphur coal or alternative fuels, enlarging green areas, restructuring industrial areas, and reducing vehicle emissions. Beijing's bid to host the 2008 Olympics will, in large measure, hinge on its ability to control its staggering pollution levels, particularly as the International

Olympic Committee recently decided that host cities must meet environmental standards.

There is an ongoing campaign by the municipal government to encourage households to use natural gas instead of coal. As part of this campaign, construction was recently completed on China's largest gas-powered thermal energy plant in Beijing. A new gas compression station in central Shaanxi province and pipeline to Beijing has increased the available supply of natural gas. According to the China National Petroleum Corporation, in the winter of 1999-2000, consumption of natural gas in Beijing rose from 3.2 million cubic metres (m^3) to approximately 6.8 million m^3.

Both industrial waste and untreated sewage have contributed to the pollution of Beijing's canals. While the Beijing Municipal Water Conservancy Bureau is pursuing an extensive clean up of Beijing's waterways by the end of 2000, only 40% of wastewater is expected to be treated prior to it being discharged into the city waterways. The government plans to spend a total of $3.9 billion to resolve Beijing's water pollution problems by 2010.

In 2000, the Ministry of Science and Technology began a one-year research project on air pollution in Beijing. Jointly administered by Beijing University, Beijing Environmental Surveillance Centre, and Qinghua University, the project objectives are to design better policies, regulations and technologies to help the city minimize air pollution by 2002.

The State Environmental Protection Agency has approved Beijing as a pilot city for the ISO 14000 environment management system.

Tianjin

As in other large Chinese cities, both water and air pollution are chronic environmental problems in Tianjin. Tianjin is located in the lowest reaches of the Hai River Basin. Seven of the nine major rivers in the basin flow through Tianjin to Bohai Bay. While the capacity of Tianjin's Dongli Sewage Plant is the largest in China, the city lacks a comprehensive sewage collection system and most sewage and industrial waste is still discharged untreated into the river system. Surface water is heavily polluted and water quality in most areas does not meet standards for agricultural use. Water quality in Bohai Bay is also deteriorating and occurrences of Red Tide are increasing. The State government has designated Tianjin as one of the four Chinese cities requiring urgent intervention in pollution prevention and control.

The Tianjin Municipal Environmental Protection Bureau is pursuing a campaign to limit industrial emissions. The campaign has targeted the leading industrial polluters, including factories that produce steel, cement, pesticides, leather and starch. However, the campaign's effectiveness is limited due to the strong commercial interest in promoting industrial growth. For example, while the popular mini-van taxis ("miandi")

were recently banned in Beijing due to poor emission quality, these notorious polluters continue to operate in the streets of Tianjin where they are manufactured.

Tianjin has a developed infrastructure for transportation and industrial/domestic consumption of compressed natural gas (CNG) and LPG, making Tianjin China's foremost city in its use of gas.

Hebei Province

Hebei has suffered from serious environmental problems in recent years, including drought, earthquakes and insect infestation. Due to drought and excessive exploitation of ground water, the water table in Hebei has dropped dramatically in the last several years and, in some areas of the province, urgent measures are needed to safeguard drinking and agricultural water supplies.

A related issue is desertification. According to government estimates, more than 1.7 million hectares of land have been affected by desertification in Hebei (approximately one tenth of the province's total land area). In some areas, desertification rates have reached as high as 4% annually.

Water pollution is also a serious issue in Hebei. The province is home to several rivers that feed the Haihe River Basin, near Tianjin and Beijing. Over 70% of the 42 rivers in the province are so severely polluted that their water is not suitable for drinking. The SEPA recently established a surveillance network to monitor water conditions in the Haihe River Basin. Based in Shijiazhuang, data collected will be used as a foundation for treatment of surface and underground water resources, as well as for future urban planning.

Pollution of the coastal waters of the Bohai Sea is a major concern for coastal fisheries. There were four incidents of Red Tide in the region in 1999.

In 1999 the Hebei Province closed down some 245 major sources of pollution and 92.8% of the province's industries have succeeded in meeting the state's environmental protection standards.

Shandong Province

Shandong, like many industrial provinces in China, faces serious environmental problems — industrial water and air pollution in particular. The situation is most acute in Jinan, a centre of heavy industry. Jinan has a heavy concentration of textile, cement, metallurgical and petrochemical manufacturing. It suffers from the worst air pollution in Shandong, and is one of the 10 most polluted cities in China.

A campaign to clean up the environment is underway in Jinan. However, chronically high pollution levels persist, and much more effort and funding will be required. Current projects include planting up to 7100 hectares of new forests, closing plants identified as chronic polluters (four cement plants in Jinan will be closed this year), implementing new standards for coal burning (lower sulphur content ceilings), and banning the use of coal for cooking. The government will also promote conversion to clean burning fuels such as natural gas.

Yangtze River Delta

The Yangtze River Delta is the land mass that makes up the mouth of the Yangtze River and comprises the municipality of Shanghai and the three provinces of Anhui, Jiangsu and Zhejiang. At the edge of the Delta, China's longest river, the Yangtze enters the Yellow Sea after flowing for 6300 km through seven provinces. With Shanghai at the forefront, the Delta is the largest economic region in China. It leads the country in market size, economic output, regional GDP, foreign investment and trade, and consumer spending. With 200 million people and one quarter of China's economy on a land base half the size of Alberta, the Yangtze Delta is one of the most concentrated markets in the world.

Shanghai

As in every large Asian city, air and water pollution are the major environmental problems in Shanghai, due to industrial and domestic waste. Shanghai has announced that over the next five years it will allocate 3% of its annual GDP (or approximately $2 billion) to pollution control, the highest rate in China. As part of a comprehensive municipal blueprint to reduce air, water and industrial pollution and increase green space in Shanghai, the municipal government has indicated that the city will focus on curbing water pollution problems.

Other initiatives include reducing automobile exhaust emissions, promoting the use of natural gas and legislating the use of lead-free gasoline. Shanghai is the largests automobile manufacturing centre in China. There are more than 500 000 registered cars, trucks and buses. In order to meet the European No. 1 Discharge Standard, many joint ventures involving large international companies, such as German Bu Shi and Corning from the US, have been established or in the process of being established.

Other urgent problems in Shanghai include rising pollution levels from animal and human waste in the upper reaches of the Huangpu River, a major source of drinking water for Shanghai. The Shanghai Municipal Bureau of Environmental Protection is planning to construct several sewage treatment plants to address these problems. One project under way is the Songjiang Wastewater Processing Plant, the second phase of

which has been completed. According to municipal officials, there are 194 projects designed to curb water pollution scheduled for completion this year at a cost of $6.8 billion.

Anhui Province

The Ministry of Water Resources has undertaken a campaign to clean up Chaohu Lake, one of China's five largest lakes and a major source of drinking water for Hefei. During the campaign, almost 20 factories along the lake were shut down due to high effluent levels. Despite these efforts, an estimated 280 million tonnes of sewage continue to flow into the lake every year and further clean-up campaigns will be required. The lake also suffers from serious soil erosion.

Anhui Province is currently experiencing its worst drought in 50 years. Millions of dollars and about 400 000 pumps are being used to combat the drought. By August 2000, the drought had caused water shortages for 3.14 million people and 760 000 heads of livestock and had led to over $825 million in direct economic losses.

In 1999, the State Council approved a plan to reduce acid rain in Anhui. The plan, which covers the cities of Tongling, Wuhu, Ma'anshan, Huangshan and the prefectures of Xuancheng and Chaohu, will focus on mining reform as well as the introduction of new environmental technologies in the electric power, chemical, metallurgy, building material and nonferrous metal sectors.

Jiangsu Province

Like most provinces in China, Jiangsu is facing chronic pollution problems due to recent rapid industrial expansion, with little or no regard for pollution control standards or enforcement. In 1999, the Jiangsu government launched an aggressive campaign to clean up industrial discharge into the Yangtze River. However, the province has spent only $10.5 million on pollution control in recent years — much greater effort and more resources will be required to adequately address the challenges Jiangsu faces.

The Taihu Basin, a watershed that is home to 300 million people in Shanghai, Jiangsu and Zhejiang, is one of the most industrialized and polluted areas of the country. Investment in this area is primarily in pollution producing industries such as fine chemicals, printing and dyeing, pesticides, tanning and food processing. The area's industries are in urgent need of new, environmentally friendly technologies — particularly advanced equipment to minimize pollution discharge.

Southwest China

The three provinces of Sichuan, Guizhou and Yunnan, and the municipality of Chongqing are located in Southwestern China, along the middle and upper reaches of

the Yangtze River. This region is rich in natural resources and has a strong agricultural and industrial base. With a combined population of 210 million people, these interior provinces represent a promising untapped market for Canadian exporters.

The region's growing importance in China's overall economic development is the focus of a new policy by the Chinese government to develop the country's western provinces through a series of tax incentives and infrastructure investments. An office has been set up under the State Council to co-ordinate and implement this policy, and new funding initiatives and infrastructure programs are being developed.

Sichuan Province

Sichuan's major environmental protection infrastructure projects involve management of solid waste and wastewater, and the reduction of air pollution. These efforts are being supported by the World Bank, which has provided a $223 million loan to Sichuan for wastewater treatment, and by the ADsB, which is funding a water supply project in Chengdu. Sichuan has encouraged the use of compressed natural gas vehicles (CNGV) and has set up a CNGV Leading Group under the Sichuan Development and Planning Commission. Thirty-five gas refilling stations had been built by the end of 1999. Sichuan is also promoting clean technology standards for industrial production and ISO certification to assist in its export drive.

Employees of Sichuan's Environmental Protection Bureau have been regular participants in the GLOBE series of environmental exhibitions, held biannually in Vancouver, and have made site visits to Canadian environmental research institutes and businesses. Canadian companies in this sector are recommended to use the networking opportunities presented at GLOBE, and to monitor the Web sites of the major international financial institutions (IFIs) for bidding information on upcoming projects.

Chongqing

Chongqing's heavy industrial base has resulted in a legacy of water, air and soil pollution, making the city one of the most polluted in China. The World Bank is investing over $300 million in Chongqing Industrial Reform and Pollution Control projects, which include a long-term program of water resource management through wastewater and solid waste engineering. Funding from the Overseas Economic Co-operation Fund of Japan (OECF) and the European Union has also supported improvements to Chongqing's air quality through the purchase of desulphurization equipment and other technical assistance. Most of the older SOEs in Chongqing depend on local coal for power generation, which is high in sulphur and other toxic chemical levels.

Some 230 000 people and 460 businesses are expected to be moved out of Chongqing by June 2003 to make way for the Three Gorges Dam. The government estimates that

of the 1.13 million people who will be displaced by Dam, 85% will be from Chongqing. Approximately half of those displaced will move before 2003, when the waters of the Yangtze will begin rising and the dam's first 14 turbines begin operations -- the remainder will move by 2009 when the reservoir is filled.

The Canadian Consulate recruited a delegation from Chongqing's Environmental Protection Bureau, related agencies and the private sector to attend GLOBE 2000, to acquaint them with the capabilities of Canada's environmental sector.

South China

South China, including the provinces of Guangdong, Fujian and Hainan, as well as the Guangxi Autonomous Region, is one of the most economically dynamic regions in China. With a population of over 160 million, South China has been the recipient of over 50% of foreign investment into China during the past 20 years. The region boasts almost half of the nation's imports, and the highest income levels in the country, making it an enticing market for many Canadian exporters and investors.

The rapid economic development in South China, particularly in Guangdong province, has created significant prosperity in the region. However, the sacrifice of the environment has been pronounced. The discharges of industrial and municipal wastewater, toxic air and solid waste have severely contaminated local surroundings. The incidents and levels of acid rain, red tide, brackish water and floods are increasing. As the conflict between economic development and the health of the environment increases, an awareness of environmental protection has developed among the public and the decision-makers. New strategies of sustainable development are framed to improve the living quality and the investment environment.

The four provinces in South China, led by Guangdong, have started a new round of environmental protection to redeem the damage and protect current resources. Guangdong, while creating new economic strengths, started its *Clear Water Project*, which requires an investment of over $3.5 million, in June 1997. The *Blue Sky Project* initiated in February 2000, requires an investment of over $1 billion. The *Green Project Plan,* which will establish a provincial environmental management system and the promulgation of local environmental policies and rules that serve the local market economy, was drafted into Guangdong's 10th Five-year Plan (2001-2006).

The recent National People's Congress required that each province triple its investment in environmental protection. Investment in environment will accordingly raise its current ratio of 0.5% share in GDP to the targeted 1.5%. The year 1998 witnessed investment of $18 billion by the central government in infrastructure construction, another $18 billion was invested in 1999 for the same purpose. Among the projects, environmental protection is key.

All of the five national Special Economic Zones (SEZs) are located in South China. These were set up by the central government not only to attract investment, but also to provide experience with experimental policies. Examples include modified tax regimes, visas-on-arrival, and relaxed requirements regarding foreign investment in traditionally controlled sectors. Shenzhen, one of the most successful zones, borders Hong Kong and has grown from a small fishing village less than 20 years ago, to a modern cosmopolitan city of over four million. Shantou attracts interest from Southeast Asian investors and business people, while Xiamen rides a successful wave of investment from Taiwanese investors, among others. Zhuhai, the "Green City" is located opposite Macau, and the entire province of Hainan island operates with SEZ privileges.

A significant number of Chinese-Canadian immigrants have their origins in South China, resulting in strong ties between South China and Chinese communities in Canada. Much of the early Canadian investment in China involved projects backed by Canadian Chinese. Trade flows in this region have been affected, with family ties helping Canadian exporters to build strong and lasting business relationships with entrepreneurs in South China.

Opportunities

China is implementing a countrywide "One Control, Two Standards being met" policy, which requires provinces to limit their general volume of pollution discharge and the meet industrial waste discharge standards. Key economic cities and tourist cities are required to meet water and air quality standards.

Pressured by environmental degradation and huge economic loss caused by pollution, China is reforming its industrial structure and introducing the concept of clean production to gradually abandon the traditional end-of-pine pollution control. China is introducing the Inverse Manufacturing Analysis (IMA) concept which balances the economic and environmental impact of an industrial process, and assumes that the waste from the upper processing chain can be utilized as the material for the lower processing chain. Ultimately, final discharge of organic waste from an industrial processing should be converted to energy through technologies including co-generation, pure oxygen burning, low grade oil distillation from waste, and system integrated technology.

Under China's Western Development Strategy (WDS), the government has pledged to invest heavily in 10 regions: the provinces of Shaanxi, Gansu, Qinghai, Sichuan, Yunnan and Guizhou, the ethnic autonomous regions of Ningxia, Xizang (Tibet) and Xinjiang, and the municipality of Chongqing. These regions cover 5.4 million sq. km, or 57% of the national total. Their combined population of 280 million represents 23% of the national population. Most noteworthy, this region is home to half of the country's proven energy reserves of coal, petroleum and natural gas, and boasts important

mining, forestry and agricultural resources. The total WDS budget will be over $1.5 billion and the World Bank has undertaken to provide financial support as well.

The core elements of the strategy include a pledge to direct at least 60% of the China Development Bank's lending to the interior regions and to encourage investments by foreign governments and IFIs. In order to accelerate the development of China's West, the central government will also adopt preferential policies and tax incentives for those who invest. For example, the Ministry of Land and Resources announced more liberal regulations for the acquisition of mineral or land-use rights, and pilot projects have been developed to streamline approvals for mining and petroleum sector development in certain regions.

Beijing is in the process of converting its fleet of municipal vehicles from gasoline and diesel to either LPG or CNG. Opportunities exist for Canadian companies in natural gas conversion and related equipment. As Beijing seeks to enforce stricter emission regulations, there may also be opportunities for Canadian companies in emission pollutant detection equipment.

Canadian companies with technologies or services in water resource management and environmental consulting services may find opportunities in Hebei.

By accessing foreign aid or international development bank funds, opportunities exist for Canadian enterprises in equipment and technology to treat and prevent air and water pollution, and solid waste, as well as to control pollution in the Yangtze and Huaihe Rivers and Chaohu Lake, and in urban industrial construction areas.

In 1993, China launched a national environmental monitoring network, which it plans to update by the end of 2000. New features of the network will include monitoring networks to support priority environmental protection plans in major water bodies, monitor air quality in major cities, and monitoring pollution in key pollution industries. According to SEPA, the project will require approximately $45 million in imports of monitoring equipment, with an average expenditure of $900,000 per city.

While money for environmental projects is often an issue in China, there is an expectation that funding will be made available for many projects in Beijing as the city competes to host the 2008 Olympic Games and as the Chinese leadership and Beijing residents apply pressure on the local government to pursue environmentally friendly policies.

Actual and Planned Projects

Although the most significant constraint to accessing China's environmental protection market continues to be the lack of hard currency financing, China is the largest borrower from both the World Bank and the AsDB, representing significant commercial

opportunities for Canadian firms. As a result of Canada's status as a shareholder in both institutions, Canadian companies are eligible to supply goods and technical assistance related to loan-funded projects. In 1999, China borrowed $3.1 billion from the World Bank and $1.9 billion from the AsDB.

China's serious water resource problems have become a priority for some IFIs. In the last few years the World Bank and the AsDB have focussed their funding efforts in China towards infrastructure projects, especially water projects. However, it is estimated that IFIs are capable of supplying a mere 15% of funding requirements.

In the past, projects funded by IFIs presented opportunities for foreign companies in the Eastern China. However, as the Chinese central government has now shifted its focus to promoting the development of the western regions, so too have the principal IFIs, the AsDB and the World Bank. The practical outcome of this shift is that there are fewer large-scale IFI-funded projects in Eastern China. Canadian companies should monitor IFI project lists to establish early contact with project executing agencies.

Companies may supply technical assistance services directly to the banks, in support of project design and feasibility work; however, loan-funded projects themselves are generally managed by Chinese executing agencies. The procurement of loan-funded goods and services by these agencies is subject to lending institution rules governing fairness and transparency, and companies can appeal if they feel that the procurement process is not being properly followed. In both cases, because of the substantial costs in time and travel involved, it is recommended that Canadian companies active in the environmental sector evaluate and, where appropriate, pursue opportunities as an element of their business plan for the region.

For links to the World Bank and AsDB Web sites, and for copies of related business guides, companies are encouraged to consult IFInet on the Web site of the Department of Foreign Affairs and International Trade (DFAIT) at http://www.dfait-maeci.gc.ca/ifinet.

The World Bank

World Bank lending to China has been primarily in three sectors: agriculture (29%), transportation (24%) and energy (19%). The World Bank finances economic development and reform programs that support government efforts in the energy sector, the improvement of basic infrastructure, the development of key institutions and systems to support a market-oriented economy, and the development of the financial sector.

The World Bank attracts private investment for projects involving large sums of long-term financing, or in areas where there is high political risk. It shares the risk with private lenders, that is, it provides only partial guarantees. The World Bank can issue a loan or employ two types of guarantees: a Contractual Compliance Guarantee, which

protects private lenders against specific risks identified by the Canadian government, the private party and the Bank; or a Partial Credit Guarantee, which protects private lenders against possible late loan payments and finances extensions of medium-term loans.

China has been a member of the World Bank since 1981, and since 1992, has been the Bank's largest borrower of investment financing. In 1999, the Bank's loans to China totalled $3.1 billion. Recently, the Bank published an environmental study, *Clear Water, Blue Skies*, which is part of the *China 2020* report — a seven part report on development in China. The study was produced in close collaboration with SEPA and the State Development Planning Commission.

The following is a partial list of projects funded by the World Bank in China. Please consult the World Bank Website (http://www.worldbank.org.cn/English/home.asp) for a complete list of projects.

- Beijing Environmental Protection Projects (BEPP): The World Bank has approved a $500 million loan for the second phase of BEPP. The aim of these projects is to decrease the city's air pollution and improve its sewage treatment system. Funding will be used to replace coal-burning boilers with gas-turbine boilers, to install more energy-efficient heating equipment, to build a sewage collection and treatment system and to strengthen Beijing's environmental management capabilities.

- Shandong Environment Project: The World Bank has provided a loan to support China's efforts to implement a sustainable environmental framework for the long-term economic and social development of the province while supporting industrial growth. The project focuses on wastewater management and efficient use of water resources in Jinan, as well as heating system improvements in Yantai and Weihai. The project is scheduled to be completed by 2003.

- Hubei Urban Environmental Project: The goal of this $223 billion World Bank project is the improvement of water quality in the urban areas of the mid-Yangtze River basin through interceptor sewer systems, wastewater treatment facilities and sanitary landfills.

- Chongqing Industrial Reform and Pollution Control Program: The World Bank is funding the Chongqing Industrial Reform and Pollution Control project, which includes a long-term program of water resource management through wastewater and solid waste engineering. The project incorporates the procurement and installation of wastewater treatment and sanitary landfill developments, as well as upgrading the water supply and distribution system.

- Liao River Basin Project: The World Bank's Liao River Basin project will be implemented in the provinces of Liaoning, Inner Mongolia and Jilin and focus on major river basin pollution cleanup. The policy component will focus on environmental management and urban services pricing. The investment component is expected to cover water supply, wastewater management, municipal and industrial solid waste, heritage asset management and environmental resource protection.

- Huai River Basin Pollution Control Project: The Huai River Basin Pollution Control project will assist local governments in developing and financing municipal pollution control investments in two provinces (Anhui and Shandong) and formulating policies to control water pollution in the basin. Consultants have been appointed for project preparation. Implementing agencies are at the provincial level (Urban Construction and Finance Department).

International Finance Corporation

The International Finance Corporation (IFC) is a member of the World Bank Group, which provides non-government guaranteed direct investment in private businesses. The IFC has been active in China since 1969, and has five main objectives: to encourage globally competitive industries by attracting capable foreign sponsors; to assist in restructuring SOEs; to support the growth of domestic non-state sectors; to promote the development of capital markets; and to develop limited-recourse financing.

Asian Development Bank

The AsDB was founded in 1966. This multilateral development finance institution has capital stock owned by 57 member countries. The AsDB currently has approximately $800 million worth of environment projects in development in China, and has scheduled a further $1.7 billion worth of projects for the period 1999-2001. AsDB funds have been allocated mainly to the following sectors: transportation and communications (46.1%) and energy (19.2%). There are also a number of projects focussed on water supply and sanitation.

The AsDB has published a document entitled *The Asia Least-Cost Greenhouse Gas Abatement Study*, which looks at potential reductions in greenhouse gas (GHG) emissions across the Asia region. A study of China, which would assist anyone looking for potential Clean Development Mechanism project ideas in China, is included.

The following is a select list of projects funded by the AsDB. Please consult the AsDB Website (http://www.adb.org) for complete and up-to-date information on projects.

- Tianjin Wastewater Treatment and Water Resources Protection: The AsDB is providing a loan of close to $150 million to support a $300 million wastewater

and water resources project in Tianjin. Project approval is expected this year and completion is scheduled for 2005. The project includes the construction of Beicang wastewater treatment facilities and implementation of a water resources protection scheme for the existing Luan-Tianjin diversion system.

- Suzhou Creek Rehabilitation: AsDB is providing $445 million the first phase of a 12-year program (1998-2010) to rehabilitate the Suzhou Creek. Phase I will be implemented over a five-year period (1999-2003) and includes the improvement of the wastewater management system including sewage treatment and disposal, the introduction of water resource management and quality control methods, and the provision of sanitation services.

- Hai and Luan Wastewater II (Hebei): The Hai River is one of the "three river" basins that is receiving priority treatment. The AsDB has provided $900 million to refine its strategic plans for management of the river basin. The plan is to improve water quality to meet national drinking water standards.

- Ningxia Shapoutou Water Resources: The AsDB has provided $1.4 billion to improve management of land and water resources to increase farm income and reduce poverty in this disadvantaged region of China. The project may include construction of a storage dam, remodelling and rehabilitation of canal networks and development of groundwater improvement of drainage and strengthening of systems operation and maintenance.

- Hohhot and Baotou Urban Development and Waste Management: The AsDB has provided $900 million to the two largest cities of the Inner Mongolia Autonomous Region to improve the delivery of urban infrastructure and services. The project involves preparation of an urban structure plan for the region for 2001-2005, including wastewater management, improvements and expansion of central heating systems, and solid waste management.

United Nations Development Program

The United Nations Development Program (UNDP) assists China in its efforts to promote national economic, social and environmental programs. Donations from member countries are used to provide grants for a variety of projects at the national and local levels. One of the UNDP's funding projects is the Global Environmental Facility (GEF). GEF is a source of funds for projects on GHG reduction, biodiversity/ conservation and international water protection.

Beijing Environmental Protection Projects: Besides World Bank funds (see above), these projects will received a $37 million donation from GEF. The project includes replacing coal-burning boilers with gas-turbine boilers which will substantially reduce GHG emissions.

COMPETITIVE ENVIRONMENT

Local Capabilities

Competition from domestic companies is increasing. In 1998, there were over 9000 environmental protection enterprises registered in China, with an output value of $10 billion and accounting for 0.7% of the GDP. While local firms may have the advantage of local distribution networks and links to local governments, the bulk of the domestic industry still produces low-end technologies and can't compete with more sophisticated equipment imported from developed countries. While the Chinese government is eager to foster the development of its domestic environmental companies, it recognizes the need for foreign high-tech equipment. Thus, it strongly encourages companies to enter into joint ventures.

As many environmental companies in China are currently small-scale with low-end technology, lack of governmental policy support, macro control and centralized planning can cause vicious circle competition in the industry. To better prepare for competition from foreign environmental companies, China is encouraging its bigger environmental companies to expand in size and reinforce R&D strength and capacity of manufacturing integrated equipment.

There are currently about 32 000 water supply companies operating in China and that number is increasing. However, many of these companies produce low-end technologies and look to foreign producers for more sophisticated equipment. In the wastewater treatment sector, the same scenario exists.

Regarding air pollution control, China manufactures most of its own particulate control equipment. It is expected that, as the market grows, China's State Council will encourage local development of desulphurization equipment — or at least the production of various components of such systems.

There are approximately one dozen manufacturers of vehicle emissions control instruments in China and most are small-sized enterprises. Locally manufactured equipment and technologies include interior purifying equipment such as ventilation equipment, purifying magnetic systems, high-energy ignition devices, and emissions control equipment such as oxidized catalytic converters.

International Competition

Canadian companies interested in gaining access to the Chinese environmental protection market will face strong competition from Japan, the U.S. and the EU. Next to having an appropriate technology or product, adaptability is very important. To be successful, Canadian companies must have a well-focussed strategy, a long-term

commitment, and must maintain a continuous local presence. Building relationships with local research institutes, agencies or government bodies represents an effective way to promote products and services.

While foreign technologies — including those of Canada — are acknowledged to be of superior quality, Chinese buyers are often more concerned with financing and price. Soft loans and grants from foreign governments strongly affect Chinese end users' purchasing decisions.

Increased demand for desulphurization equipment, electrostatic precipitators (especially those resistant to high temperatures, moisture and corrosion), coal cleaning and combustion technologies and environmental monitoring equipment, has led Chinese companies to look to foreign suppliers. In the longer term, market demand for equipment to reduce nitrogen oxides is expected to rise.

In 1997, foreign competition in the water treatment and supply industry came from Japan (28%), Germany (15%), U.S. (11%), and Taiwan, Korea, France and Italy (each with a 7% market share). Foreign competition in the industrial wastewater treatment industry was also dominated by Japan (40%), Germany (30%) and the U.S. (12%). As for the industrial air pollution control market, imports were mainly from Japan (40%), Germany (25%), Finland (25%) and the U.S. (10%). The U.S., however, provides 25% of the market share for vehicle emissions control equipment. They are followed by Japan (10%) and the EU (15%). Germany is the dominant foreign player in the solid waste treatment market with a 35% market share, Japan (30%) and the U.S. (25%) are also key competitors.

Canadian Position

There are a number of specific agreements and arrangements between Canada and China including the General Agreement between the Government of Canada and the Government of the People's Republic of China on Development Co-operation — the Memorandum of Understanding (MOU) on Environmental Co-operation, the MOU on Co-operative Meteorological Programs, and the MOU on Renewable Energy and Energy Efficiency. Both countries are also working together through the China Council for International Co-operation on Environment and Development to support of China's efforts to promote environmentally sustainable development.

Environment Canada and SEPA signed the MOU on Environmental Co-operation in 1993 and renewed it in January 1998. The agreement provides a framework for the reduction of GHG emissions, providing assistance to China in domestic environmental protection and the promotion of Canadian commercial opportunities, particularly in pollution control technologies. The MOU was specifically designed to assist Canadian industry in marketing its products, technologies and services. Partnerships between Canadian companies and local Chinese firms are facilitated by this technology transfer

agreement. In addition, numerous subagreements have been signed since 1993. The MOU will continue to expand co-operation in the area of environmental protection between the two nations.

The Canadian Government has organized and led trade missions to China and has co-ordinated private sector participation in the Canadian Pavilion at several international exhibitions in China (ETC, CIEPEC). Private sector participants in these activities have realized sales of goods and services to China in areas such as waste to energy plant, wastewater treatment equipment and systems, solid waste treatment equipment, and air pollution control equipment. Industry Canada has also organized and led Canadian Environmental Technologies Workshop to China, recruited Canadian speakers and introduced Canadian technologies to appropriate Chinese companies. The department also produced the first Canada-China Environmental Solutions Directory to promote technology transfer between the two countries.

Competitive Advantage through Canadian Government Policies and Initiatives

Framework Statement for Co-operation on Environment

In November 1998, the Government of Canada and the Government of China signed the *Framework Statement for Co-operation on Environment into the 21st Century*. In the statement, both parties agree to co-operate on environmental issues and to "develop and implement co-operation projects to address the challenge of climate change."

Program for Export Market Development

The Program for Export Market Development (PEMD) helps Canadian companies enter new markets by sharing the costs of activities that companies normally could not or would not undertake alone, thereby reducing risks involved in entering a foreign market. Eligible activities include market visits, trade fairs, incoming buyers, product testing for market certification, legal fees for international marketing agreements, transportation costs of offshore company trainees, product demonstration costs, promotional materials, and other costs necessary to execute a market development plan. Activity costs are shared on a pre-approved, 50/50 basis.

The PEMD refundable contribution ranges from $5,000 to a maximum of $50,000. Preference is given to companies with less than 100 employees for a firm in the manufacturing sector and 50 in the service industry, or with annual sales between $250,000 and $10 million. Other components of the program include international bid preparation (Capital Project Bidding) and, for trade associations, developing international marketing activities for their membership. For additional information visit http://www.infoexport.gc.ca/pemd-e.asp or call 1-888-811-1119.

Technology Early Action Measures

Technology Early Action Measures (TEAM) has been established as part of Canada's Climate Change Action Fund. TEAM offers additional support to federal programs that fund technology projects designed to reduce GHG emissions nationally and internationally, while sustaining economic and social development. Eligible projects will demonstrate innovation in the transportation, energy, agriculture and various industrial sectors. To achieve the greatest results, TEAM will assign top priority to projects that demonstrate significant financial partnering with a number of interested parties, such as the private sector, provinces and municipalities. TEAM projects must be approved under existing federal government technology advancement programs.

Export Development Corporation

Export Development Corporation (EDC) is Canada's official export credit agency, facilitating Canadian trade with over 200 world markets. EDC's first transaction with China took place in 1980 and since this time EDC customers — Canadian companies of all sizes — have concluded over $5 billion of business in China. A variety of EDC trade finance services have been employed in the China market. Financing is traditionally offered on a case-by-case through lines of credit established with select Chinese banks. Export financing may also be considered via direct buyer loans to creditworthy companies which have Chinese government authority to borrow funds abroad. In addition, EDC export and investment insurance programs provide exporters with protection against a variety of risk, both commercial and political. Performance security and contract bonding programs also help exporters by providing exporters with the ability to free up working capital while meeting bonding requirements during the execution of commercial contracts.

Canadian Commercial Corporation

The Canadian Commercial Corporation (CCC) gives Canadian companies access to financing and better payment terms under the Progress Payment Program (PPP). The PPP concept was developed as a partnership between major Canadian financial institutions and the CCC. It enables the exporter's bank to open a project line of credit for the exporter's benefit, based on CCC approval of the project and the exporter's ability to perform. The CCC will also act as a prime contractor on behalf of Canadian small and medium-sized enterprises, giving those businesses increased credibility and competitive advantage.

WIN Exports

WIN Exports, a database of Canadian exporters and their capabilities, is used by trade commissioners around the world and by Team Canada Inc partners in Canada to match Canadian suppliers with foreign business leads, and to share information on trade

events. To register your company in WIN Exports or for more information, visit http://www.infoexport.gc.ca/winexports/menu-e.asp or call 1-888-811-1119.

Canadian Office for Technology Exchange in the Environment

The Canadian Office for Technology Exchange in the Environment (COTE) assists public organizations and companies around the world in forming relationships with their Canadian counterparts, helping to develop their technological capacity and contributing to global sustainable development. COTE believes that the best way to ensure long-term environmental benefits to all countries is to bring public- and private-sector organizations together as partners working together toward common goals. COTE primarily focusses on technology exchange as a way of activating domestic and international co-operation and business networks.

To this end, it maintains a current inventory of Canadian technological capacity in areas such as potable water, wastewater, watershed management, solid and hazardous waste and soil decontamination, GHG reduction, energy efficiency, environmental assessments and geomatics. This permits COTE to match the needs and capabilities of foreign countries with Canadian capabilities, from both the public and private sectors, and to facilitate the development of mutually beneficial arrangements. COTE recognizes the priority given to environmental protection, sustainable development and climate change by a large number of countries around the world. In this context, it aims at supporting the contribution that Canadian environmental organizations and firms wish to provide, either bilaterally or in co-operation with international institutions, to international environmental projects.

Canadian International Development Agency

The growing recognition of the importance of environmental issues led to a Chinese government decision to establish the China Council for International Co-operation on Environment and Development (CCICED). The Council is composed of approximately 25 Chinese members and an equal number of international members. SEPA has been designated as the responsible Chinese organization, and has established a Secretariat in Beijing to support the operations of the Council. This decision coincided with attempts by the Canadian International Development Agency (CIDA)-China program to integrate environmental concerns within its ongoing activities and prepare an environmental strategy. The Chinese request for Canadian support in the operation of CCICED fit well with the program's long-term plans to support the efforts of China in this critical field. CIDA, therefore, undertook a five-year CCICED project, and designated the David See-Chai Lam Centre at Simon Fraser University (SFU) as the Canadian Executing Agency under a Contribution Agreement that came into effect in January 1992. After China and Canada decided that this unique international co-operation should be continued beyond the initial period, SFU and CIDA signed another five-year Contribution Agreement, which came into effect on March 24, 1997.

The goal of the CCICED Project is to assist China in developing integrated, coherent policies that recognize the critical linkages between environmental sustainability and economic and social development. While Canada is the "lead" donor, the project is structured to permit the involvement of other international organizations and agencies, like the United Kingdom's Department for International Development, the Norwegian Agency for Development Co-operation and the Netherlands Environment Ministry. This serves to reinforce the international character of the Council.

Canada-China Co-operation Project in Cleaner Production (282/19158)
Duration: 1996 to 2001
CIDA Contribution: $10.5 million
Canadian Executing Agencies: Price Waterhouse Coopers/SNC Lavalin Environment/ESSA Technologies
Chinese Partners: State Economic and Trade Commission/State Environmental Protection Administration
Location: Anhui Province
Contact at CIDA: Charles Pellegrin

Description: This project responds to China's severe environmental degradation and heavy industrial pollution problems linked to outdated industrial infrastructure, outmoded management practices and production techniques, energy inefficiencies, and the wasteful use of resources. It emphasizes pollution prevention from source, and involves conserving raw materials and energy, eliminating toxic raw materials, reducing the quantity and toxicity of emissions and waste, and decreasing impact along the entire life cycle of a product. This project will help to promote the implementation of cleaner production processes within light industry and the chemical industry. It will support government agencies and enterprises in the actual application of cleaner production processes at two selected enterprises in the Anhui Province in the Huai river basin, and will foster co-operation between Chinese and Canadian counterparts. Canadian firms involved in this project will be well-placed to benefit from the World Bank's proposed investments in the environment and industrial restructuring in the region.

Current Status: The project is operational. Audits have been carried out and implementation of solutions are well under way at two demonstration plants. For more information, connect to the project Web site: http://www.chinacp.com

Canada-China Jiangsu Small and Medium-sized Enterprises Applied Management and Environment Project (282/19759)
Duration: 1998 to 2003
CIDA Contribution: $5 million contribution funds over five years
Canadian Executing Agency: Foundation for International Training
Chinese Partner: MOFTEC and Jiangsu COFTEC, Environmental Protection Bureau (EPB) and Bureau of Township and Village Enterprises (TVEs)
Location: Jiangsu Province
Contact at CIDA: Charles Pellegrin

Description: This project responds to severe environmental degradation and industrial pollution linked to the rapid growth of TVEs in the Province of Jiangsu, most of which are small and medium-sized enterprises. It will provide assistance to TVEs in the areas of management and environmental/ business planning; and will promote awareness of waste minimization, cleaner production and more environmentally sound technology alternatives through demonstration/pilot projects and by providing training locally, including "train the trainer" seminars to support local training capacity. The project will contribute to investments in enterprise-upgrading and the transfer of environmentally sound technologies through a $5 million environment revolving fund equally financed by China and CIDA. The project will also support sectoral linkages and the exchange of information between Canadian industries and Jiangsu TVEs, initially in the chemical and metalworking sectors.

Current Status: The project is operational. For more information, connect to the project Web site: www.ffit.org.com

China Council for International Co-operation on Environment and Development (282/20316)
Duration: 1997 to 2002
CIDA Contribution: $6.9 million
Canadian Executing Agency: Simon Fraser University – David Lam Centre
Chinese Partner: SEPA
Location: Beijing
Contact at CIDA: Angela Keller-Herzog

Description: The project helps China to develop integrated coherent policies that recognize the critical linkages between environmental sustainability and economic and social development. It supports the China Council for International Co-operation on Environment and Development, a high-level, non-governmental consultative organization that strengthens co-operation and exchange between China and the international community on such issues. The Council is assisted by seven working groups and the recommendations are reported directly to a senior representative of the State Council.

Current Status: The Council presented its recommendations directly to Chinese Premier Zhu Rongji in November 1998 at the annual meeting of the second phase of the project.

Canadian International Development Agency Industrial Co-operation Program

CIDA Industrial Co-operation Program (CIDA-INC) acts as a bridge between commercial and developmental interests. For companies considering investing in a developing country, CIDA-INC can share the costs of a viability study and, in the implementation stage, contribute to the costs of the developmental components of a project. For companies being considered for the provision of services by a host country client, CIDA-INC can share the costs of pre-feasibility and detailed studies, and contribute to the costs of complementary training, and social, gender and environment-related enhancements.

Technology Partnerships Canada

Industry Canada's Technology Partnerships Canada is an investment loan fund of $250 million that was created to assist the development and eventual export of high-technology products, including environmental technologies. Investment loans must be fully repaid, and are intended to help ensure that products with high potential actually reach the market. For more information, contact Technology Partnerships Canada at Industry Canada, or visit their Web site (http://strategis.ic.gc.ca/sc_mangb/tpc/engdoc/homepage.html).

Sustainable Cities Initiative

Industry Canada has selected Qingdao (along with Katowice, Poland and Salvador, Brazil) as a model sustainable city. The objective of the Sustainable Cities Initiative is to demonstrate how Canadian technology and expertise can produce integrated solutions for the wide rage of environmental problems created by rapid urbanization. With the support of Qingdao's municipal government, Canadian delegations have visited Qingdao and met with municipal officials and local company representatives to discuss areas of co-operation and identify opportunities for commercial projects.

Three Memorandums of Understanding (MOU) have been signed between Canada and Qingdao under the Sustainable Cities Initiative:

- The first MOU was signed in November 1999 in Montreal between IC and DFAIT & Qingdao focussing on cleaner production, capacity building and environmental industry development.

- The second MOU was signed in January 2000 in Qingdao between International Centre for Sustainable Cities (ICSC) and Qingdao focussing on Heritage Building Preservation Project in Qingdao.

- The third MOU was signed in July 2000 by Robin Clark Inc, Vancouver and Qingdao Modern Agriculture Development Centre focussing developing a model Woodland Centre in Laoshan in Qingdao.

In cooperation with Qingdao, Industry Canada has compiled a list of 23 potential projects in the city. These potential projects include: scrap tire recycling, dye factory pollution prevention and control, composting, steel mills waste treatment and municipal solid waste treatment plant. In addition to these projects, Qingdao"s ambitious infrastructure spending includes projects such as: harbour, highway, and airport construction, a telecommunication centre and power generation plants.

Environmental Technology Verification Program

To assure users of the effectiveness and reliability of Canadian technology, Environment Canada has established an environmental technology verification program. This program compiles and makes available independent, credible performance data on specific Canadian technologies. Such a service can help to overcome any reluctance by foreign private and government environmental compliance staff to install or issue permits for Canadian technologies.

Environment Canada's Environmental Technology Advancement Directorate and "Green Corps"

In addition to being a party to the MOU, Environment Canada has developed its "Green Corps." This program, administered by the Environmental Technology Advancement Directorate, is composed of professionals who are available to help Canadian companies find contracts and projects in international markets, and to help companies develop partnerships, bidding teams and proposals.

Environment Canada Compendium

Environment Canada has published a Compendium of Export and Financial Assistance Providers for the Canadian Environmental Industry (April 1999) to help technology developers identify sources of capital, export assistance, and export information. The focus of the Compendium is on private-sector organizations that are in the business of providing capital or facilitating exports for environmental technologies.

PRIVATE-SECTOR CUSTOMERS

In many areas of China water is too polluted for use in manufacturing or agriculture. In the "three lakes, three rivers" area, some industries are being targeted in clean up

programs. Most affected are the pharmaceutical, food processing, fish farming, paper, dye, paint and varnish, chemical and fertilizer industries.

Large building developments and construction projects are increasingly becoming important end-users of pollution control equipment and services.

There are also opportunities associated with large international companies active in China. These companies may be forced to meet to higher environmental standards, i.e., those of their country of origin.

PUBLIC-SECTOR CUSTOMERS

Public authorities continue to be the main end-users of environmental protection equipment and services in China.[3] Potential buyers in China for Canadian equipment and services include foreign invested enterprises, projects funded by IFIs, municipal authorities and their affiliates. SOEs may source environmental facilities as an integral part of production plant from overseas. IFIs and bilateral aid cannot satisfy China's environmental control needs. The Chinese authority is exploring greater participation from the private sector, including BOT schemes. Despite this effort, the current BOT structure still provides an insufficient rate of return to attract significant foreign investment.

Local municipalities are most interested in foreign manufactured technologies, such as monitoring systems, aerators, pumps, valves and detection devices.

Government Procurement Regulations

The State Planning Commission publishes information on the purchasing and bidding of engineering, service and goods paid by loans from IFIs and foreign governments. The Commission publishes changes in state laws and policies for purchasing and bidding. For more information, contact the China Public Procurement and Bidding Web site (http://www.chinabidding.gov.cn/indexe.html).

Although it is up to the discretion of respective procuring government agencies to determine their own suppliers and forms of procurement, public construction projects exceeding $9 million, or foreign enterprises or joint ventures exceeding $45 million, must first get approval from the central government.

[3] Public authorities make up 60% of total end-users, followed by state firms (20%), joint venture industries (10%), and foreign aid recipients.

MARKET LOGISTICS

Channels of Distribution

Some of the best methods for distributing environmental products include:

- the establishment of a joint venture or partnership with a Chinese company, especially those with links to the government;
- the use of a local agent for promotion of products and technologies; and
- co-production in local factories to reduce costs of producing advanced equipment.

Market-entry Considerations

Suggested Business Practices

Foreign companies sometimes experience setbacks while doing business in China. Common difficulties include bureaucratic inefficiencies, an underdeveloped legal system and non-transparent government regulations. Some of the more prevalent problems include high import tariffs, the inability to appeal rulings by Chinese officials through a judicial review process, equivalent treatment of foreign and domestic firms (national treatment), equivalent treatment of imports from different countries (Most Favourite Nation status), access to foreign exchange, non-tariff barriers (e.g. import licences and quotas), and the subsidization of Chinese manufacturers. These issues are currently being addressed in multilateral and bilateral negotiations relating to China's accession to the WTO. Chinese officials have indicated that China is serious about resolving these issues as part of the accession package.

Working with a Chinese Partner, produced by the Centre for Intercultural Training (CIT) and CIDA, is one in a series of guides designed to help Canadians and their Chinese partners work together effectively. It includes topics such as communication, social conventions and protocol. For more information, please contact CIDA. For a list of some of the most important business "dos and don'ts" please see Appendix A of this report.

Import Regulations

A common problem faced by many Canadian firms that have entered the Chinese market is the inconsistent application import regulations. This reflects, in part, the decentralized nature of administration in China, and the strength of local centres of power, whose administrative units can often act independently of central commands and of written laws endorsed by the central authorities. In customs procedures it is not uncommon for the same product to be subject to different levies in different ports, as they each add to the basic import tariff their own administrative and miscellaneous fees.

This makes for uncertainty in the calculation of export costs and impedes the establishment of consistent, long-term commercial ties. In the case of capital projects, the approval process is often unclear, as is the ultimate decision-making authority on any particular project.

High tariffs on imports have been one of the principal impediments to Canadian exports. Canadian producers have been particularly vulnerable if their products compete against domestically produced goods or have a fixed world price. Canada is trying to reduce the tariffs applied to knowledge-based products in particular, since these are significant generators of Canadian jobs and growth. In October 1997 China reduced its average tariff rate from 23% to 17%. However, beginning in November 1999, as outlined in the Canada-China Bilateral WTO Agreement, China's tariffs on Canadian priority goods will fall from an average of 12.5% to an average of 5.2% over an average period of two and one-half years.

Local Standards, Certificates or Registrations

Canada has expressed concerns that Chinese standards, and, in particular, requirements for statutory inspection are being used as impediments to market access, and are not being imposed, as is required by the WTO, in the least trade-restrictive manner possible. Canada, in the context of discussions with China through the WTO accession process, is attempting to obtain a transparent list of the standards being applied, and is working to identify and eliminate those that are merely qualitative in nature, disguised barriers to trade or unnecessary impediments to imports. The goal is to obtain application of international standards and to increase access through such mechanisms as Mutual Recognition Agreements (MRAs).

PROMOTIONAL EVENTS

Event/Description	Organizer
2001 Guangzhou International Water Show February 27 - March 2, 2001 (annual) China Export Communities Fair Exhibition Hall, Guangzhou	China Foreign Trade Guangzhou Exhibition Corp. 117 Liuhua Road Guangzhou, China Tel.: (86-20) 8667-1346 Fax: (86-20) 8666-3416
2001 Wuhan International Exhibition on Environment Protection Technology and Equipment April 2001 (annual) Central Cina International Fair Centre	Wuhan Environmental Protection Bureau China Council for the Promotion of International Trade (CCPIT), Wuhan Sub-Council 8th Floor, International Trade Promotion Hall 217 Taibei Rd. Wuhan 430015 China Tel.: (86-27) 8577-8683 Fax: (86-27) 8579-7464
Liaoning 4th International Environmental Protection Technology and Equipment and Drinking Water Exhibition May 2001 (annual) Liaoning Industry Exhibition Hall	Liaoning International Commerce, Trade and Industry Company 284 Qiannian St. Heping District 110003 Shenyang China Tel.: (86-24) 2389-5302 Fax: (86-24) 2392-2432/8686-4791
CIEPEC 2001 – The 7th China International Environmental Protection Exhibition & Conference June 11 -- June 16, 2001 (biennial) China International Exhibition Centre, Beijing	China Association of Environmental Protection Industry 9 Sanlihe Rd., Haidian District Beijing 100835 China Tel.: (86-10) 6839-3245/6839-3900 Fax: (86-10) 6839-3748 Contact: Su Fan E-mail: fair@cepi.com.cn caepi@public3.bta.net.cn Internet: http://www.sepaeic.gov.cn/english/CIEPEC2001
Qingdao International Environmental Protection and Technology and Equipment Expo 2001 June 2001 (annual) Shandong Province International Exhibition Centre	Qingdao Trade Promotion Council Qingdao International Exhibition Company 704 Fuxin Building, 5 Minjiang Rd. Qingdao 266071 China Tel./Fax: (85-32) 581-0695

The Water Supply, Purification, Pump, Valve & Pipe Exhibition for South China July 11-14, 2001 (annual) China High Tech Fair Exhibition Centre, Shenzhen	Guangdong Convention & Exhibition Promotion Shenzhen Tel.: (86-20) 8638-4619 Fax: (86-20) 8638-4622
Water China 2001 (4th International Exhibition and Conference – Technology and Equipment for Water Treatment) September 2001 (annual) China International Exhibition Centre City water supply and wastewater treatment technology and equipment, industrial water treatment technology and equipment.	Management Promotion Centre of the Ministry of Science and Technology Beijing Zhongke Huizhong Exhibition Co. Ltd. B309 Guantong Building, 44 Huayuan Bei Rd. Haidian District, Beijing 100083 China Tel.: (86-10) 8208-1644/8207-9212 Fax: (86-10) 8207-9384
Shenyang International Environmental Protection Equipment and Technology Exhibition September 2001 (annual) Shenyang Industry Exhibition Hall	CCPIT Shenyang Sub-Council 55 Renao Rd. Shenhe District, Shenyang 110014 Tel.: (86-24) 2292-0964 Fax: (86-24) 2292-0973
Chengdu International Fair on Environmental Protection Products Equipment and Technology (CEF) April 2002 (biennial) Chengdu International Conference Exhibition Centre Analytical instruments, environmental protection products, environmental detection set and new technologies.	CCPIT Sichan Sub-Council Room 401-405 Economy & Trade Building No. 4 Chenghua St. Chengdu, Sichuan 610081 Tel.: (86-28) 333-6693 Fax: (86-28) 339-2822 E-mail: ccpitsce@mail.sc.cninfo.net
ITEP China 2002 (International Exhibition and Conference on Environmental Protection in China) August 2002 (biennial) China International Trade Centre, Beijing Air pollution prevention and treatment, wastewater and solid waste treatment.	CCPIT – Machinery Industry Sub-Council 46 Sanlihe Rd. Beijing 100823 China Tel.: (86-10) 6859-4979/6859-4934 Fax: (86-10) 6859-4995
The 3rd International Environmental Protection and Water Treatment Exhibition September 2002 (biennial) Tianjin International Exhibition Centre	China Water Pollution Prevention and Treatment Commission, Tianjin Environmental Protection Association 32 Youyi Rd. Hexi District, Tianjin, 300061 Tel.: (86-22) 2835-9862 Fax: (86-22) 2835-8567

KEY CONTACTS AND SUPPORT SERVICES

Canadian Contacts

Canadian Embassy – Beijing
19 Dongzhimenwai St.
Chaoyang District
Beijing 100600 China
Internet: http://www.china.gc.ca
Contact: David Hamilton, Trade Commissioner
Tel.: (86-10) 6532-3536
Fax: (86-10) 6532-4072

Canadian Consulate – Chongqing
Room 1705, Metropolitan Tower
68 Zou Rong Lu
Yu Zhong District, Chongqing 400010, China
Contact: Aice Xiong, Commercial Assistant
Tel.: (86-23) 6373-8007
Fax: (86-23) 6373-8026

Canadian Consulate General - Guangzhou
Suite 801, China Hotel Office Tower
Liu Hua Lu
Guangzhou, 51005, China
Contact: Fenny Sun, Commercial Officer
Tel.: (86-20) 8666-0569
Fax: (86-20) 8667-2401

Canadian Consulate General - Shanghai
Tower 4, Suite 604, Shanghai Centre
1376 Nanjing Xi Lu
Shanghai 200040 China
Contact: Gary Fan, Commercial Assistant
Tel.: (86-21) 6279-8400
Fax: (86-21) 6279-8401

Canadian Commercial Corporation (CCC)
50 O'Connor St., Suite 1100
Ottawa, ON K1A 0S6
Tel.: (613) 992-4398
Fax: (613) 995-2121
Contact: Peter Stevens
E-mail: peter@ccc.ca

Department of Foreign Affairs and International Trade (DFAIT)
125 Sussex Drive
Ottawa, ON K1A 0G2
Internet: http://www.dfait-maeci.gc.ca

China and Mongolia Division (PCM)
Contact: Marcel Belec, Trade Commissioner
Tel.: (613) 995-6962
Fax: (613) 943-1068
E-mail: marcel.belec@dfait-maeci.gc.ca

Market Support Division (TCM)
Contact: Sherrill Owen
Tel.: (613) 996-1758
Fax: (613) 944-0050
E-mail: sherrill.owen@dfait-maeci.gc.ca

Canadian International Development Agency
Asia Branch – China Division
200 Promenade du Portage
Hull, QC K1A 0G2
Tel.: (819) 997-0942
Fax: (819) 997-4759
Contact: Angela Keller-Herzog
Internet: http://www.acdi-cida.gc.ca

Canada China Business Council
(see Chinese contacts for offices in China)
Head Office
180 Dundas St. W., Ste 1502
Toronto, ON M5G 1Z8
Tel.: (416) 954-3800
Fax: (416) 954-3806
E-mail: ccbc@istar.ca

Western Canada Office
515 W. Hastings St., Ste 2600
SFU at Harbour Centre
Vancouver, BC V6B 5K3
Tel.: (604) 291-5190
Fax: (604) 291-5039
E-mail: Alison_Winters @sfu.ca

Environment Canada
Environment Technology
Advancement Directorate
351 St. Joseph Blvd., 18th Floor
Hull, QC K1A 0H3
Tel.: (819) 953-3090
Fax: (819) 953-9029

Green Corps Office:
Tel.: (819) 994-7319
Fax: (819) 994-2541

Environmental Technology Verification (ETV) Canada Inc.
300-2197 Riverside Dr.
Ottawa, ON K1H 7X3
Tel.: (613) 247-1900
Fax: (613) 247-2228

Industry Canada
Environmental Affairs Branch
235 Queen St.
Ottawa, ON K1A 0H5
Tel.: (613) 954-3080
Fax: (613) 952-9564

Sustainable Cities Office
Contact: Derek Yue, Environment Officer
151 Yonge Street, 4th Floor
Toronto, ON M5C 2W7
Tel.: (416) 973-5159
Fax: (416) 973-5131
E-mail: yue.derek@ic.gc.ca

Natural Resources Canada
Environment Division
19th Floor, Section C4
580 Booth Street
Ottawa, ON K1A 0E4
Tel.: (613) 996-8534
Fax: (613) 947-6799

Canadian Industry Associations and Chambers of Commerce

Alliance of Manufacturers and Exporters of Canada
National Office
75 International Boulevard, 4th Floor
Etobicoke, ON M9W 6L9
Tel.: (416) 798-8000
Fax: (416) 798-8050

1 Nicholas St., Suite 1500
Ottawa, ON K1N 7B7
Tel.: (613) 238-8888
Fax: (613) 563-9218

Association of Consulting Engineers of Canada
130 Albert St., Suite 616
Ottawa, ON K1P 5G4
Tel.: (613) 236-0569
Fax: (613) 236-6193

Canadian Chamber of Commerce
350 Sparks St., Suite 501
Ottawa, ON K1R 7S8
Tel.: (613) 238-4000
Fax: (613) 238-7643

Canadian Environment Industry Association (CEIA)
350 Sparks St., Suite 208
Ottawa, ON K1R 7S8
Tel.: (613) 236-6222
Fax: (613) 236-6850
E-mail: info@ceia-acie.ca
Internet: http://www.ceia-acie.ca

Canadian Standards Association
178 Rexdale Blvd.
Etobicoke, ON M9W 1R3
Tel.: 1-800-463-6727; (416) 747-4000
Fax: (416) 747-4149
E-mail: certinfo@csa.ca

Standards Council of Canada
45 O'Connor St., Suite 1200
Ottawa, ON K1P 6N7
Tel.: (613) 238-3222
Fax: (613) 995-4564

Chinese Contacts

Administrative Centre for Agenda 21
Division of Program Management on Environment and Resources
109 Wanquanhe Rd.
Haidian District, China 100080
Tel.: (86-10) 6258-8128/6256-4400
Fax: (86-10) 6258-8127
E-mail: web@acca21.edu.cn
Internet: http://www.acca21.edu.cn

Beijing Environmental Protection Bureau
Foreign Economic Co-operation Division
14 West Chegonzhuang Rd.
Haidian District
Beijing 100044 China
Tel.: (86-10) 6842-8670
Fax: (86-10) 6842-4576
E-mail: bmepb@public3.bta.net.cn
Internet: http://www.bjepb.gov.cn

Canada China Business Council
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19 Jianjuomenwai St
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Fax: (86-10) 6512-6125
E-mail: ccbc@chinaonline.com.cn.net

Shanghai Office:
Room 1901, South Tower
Hong Kong Plaza
283 Huaihai Zhong Rd.
Shanghai 200021 China
Tel.: (86-21) 6390-6791
Fax: (86-21) 6390-7310
E-mail: ccbcsh@online.sh.cn

Centre for Environmentally Sound Technology Transfer (CESTT)
109 Wanquanhe Rd.
Haidian District
Beijing 100080 China
Tel.: (86-10) 6262-6057/6256-8803
Fax: (86-10) 6256-8628
E-mail: cestt@acca21.edu.cn

China Cleaner Production Centre
Chinese Research Academy for Environmental Sciences (CRAES)
Foreign Affairs Office
Anwai Beiyuan
Beijing 100012 China
Tel.: (86-10) 6490-1533
Fax: (86-10) 6490-1532

China National Environmental Protection Corporation
33 Qihelou St., Dongchengqu
Beijing 100006 China
Tel.: (86-10) 6512-0099
Fax: (86-10) 6512-0033

Guangdong Province Environmental Protection Bureau
335 Dong Feng Middle Rd.
Guangzhou 510045 China
Tel.: (86-20) 8355-7483
Fax: (86-20) 8354-9381
Internet: http://www.gdepb.gov.cn

Guangxi Zuang Autonomous Region
Environmental Protection Bureau
5 Jiao Yu Rd., Nanning
Guangxi 530022 China
Tel./Fax: (86-77) 1586-4670

Ministry of Science and Technology
Department of Industrial Technology
15B Fuxing Rd.
Beijing 100862 China
Tel.: (86-10) 6851-2626
Fax: (86-10) 6851-5004

Sichuan Province Environmental Protection Bureau
International Corporation Division
31 Xiyu St.
Chengdu, China
Tel.: (86-28) 6125-462
Fax: (86-28) 611-9656

State Environmental Protection Administration (SEPA)
International Cooperation Division
115 Xizhimennei Nanxiaojie
Beijing 100035 China
Tel.: (86-10) 6615-1934
Fax: (86-10) 6615-3366

The Economic and Commercial Counselor's Office of the Embassy of the PRC
401 King Edward Avenue
Ottawa, Ontario
K1N 9C9
Tel.: (613)236-8828
Fax: (613)-236-5078

Financial Institutions

Asian Development Bank Headquarters
6 ADB Avenue, Mandaluyong
0401 Metro Manila, Philippines 1099
Tel.: (632) 632-4444
Fax: (632) 636-2444
E-mail: information@mail.asiandevbank.org
Internet: http://www.adb.org

ADB - PRC Resident Mission
7th Floor, Tower D
Beijing International Financial Building
156 Fuxingmennei Dajie
Xicheng District 100031 Beijing
Tel.: (86-10) 6642-6603/05/07
Fax: (86-10) 6642-6601
Internet: http://www.adb.org/PRCM

Office for Liaison with International Financial Institutions
Canadian Embassy
501 Pennsylvania Ave. NW
Washington, DC 20001
Tel.: (202) 682-7719
Fax: (202) 682-7726

United Nations Development Program
2 Liangmahe Nanlu
Beijing 100600 China
Tel.: (86-10) 6532-3731
Fax: (86-10) 6532-2567
E-mail: fo.chn@undp.org

The World Bank in Beijing
9th Floor, Building A,
Fuhua Mansion, No. 8
Chaoyangmen Beidajie
Dongcheng District
Beijing 100027 China
Tel.: (86-10) 6554-3361
Fax: (86-10) 6554-1686
Internet: http://www.worldbank.org.cn

Chinese Associations

Association of Environmental Protection Enterprises
9 Sanlihe Rd.
Beijing, China
Tel.: (86-18) 393986
Fax: (86-18) 393748

China Association of Enterprises with Foreign Investment
Xindiqiao International Business Consultancy
Xiyuan Hotel, Room 5307
1 Sanlihe Rd.
Beijing 100044 China
Tel.: (86-10) 6831-3388
Fax: (86-10) 6834-7902
E-mail: yaofang@public.3.bta.net.cn

China Association of Environmental Protection Industry
Baiwanzhuang
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Fax: (86-10) 6839-3748

China Association of Machinery Industries for Environmental Protection
MMI Building
46 Sanlihe Rd.
Beijing 100823 China
Tel.: (86-10) 6859-4839
Fax: (86-10) 6859-4846

China Automobile Manufacturers' Association
16 Fuwai St.
Beijing 100860 China
Tel.: (86-10) 6326-3604
Fax: (86-10) 6326-3602

USEFUL INTERNET SITES

Canadian Sites

Canada Business Service Centres: **http://www.cbsc.org**

Canada China Business Council: **http://www.ccbc.com**

Canada's Window on China: **http://www.canada.org.hk**

Canadian Business Map: **http://commercecan.ic.gc.ca**

Canadian Commercial Corporation: **http://www.ccc.ca**

Canadian Embassy – Beijing. "China-Hong Kong Factbook: Business Protocol in China": **http://www.canada.org.hk/english/index.html** (Note: Follow the "Factbook" link. This site is very thorough and provides ample information for new and experienced participants in the Chinese market)

———. "Exporting and Investing: SME Survival Guide to the China Market": **http://www.canada.org.hk/english/index.html** (Note: This Web page offers excellent, comprehensive information on several aspects of marketing products and services in China)

Canadian Exporters Catalogue: **http://www.worldexport.com**

Canadian International Development Agency (CIDA) – Business and Development:
http://www.acdi-cida.gc.ca/busine-e.htm

Department of Foreign Affairs and International Trade (DFAIT): **http://www.dfait-maeci.gc.ca**
China Perspectives: **http://www.dfait-maeci.gc.ca/china**
InfoExport: **http://www.infoexport.gc.ca**
International Trade Centres: **http://www.infoexport.gc.ca/section2/itc-e.asp**

Environment Canada – Global Climate Change: **http://www.ec.gc.ca/climate/index.html**

Export Development Corporation: **http://www.edc.ca**

ExportSource: **http://exportsource.gc.ca**

Industry Canada: **http://www.ic.gc.ca**
EnviroEbiz: **http://strategis.ic.gc.ca/sc_indps/environ/burst.html**
Strategis – on-line trade data: **http://strategis.ic.gc.ca**

Statistics Canada: **http://www.statcan.ca**

Chinese and International Sites

APEC home page: **http://www.apecsec.org.sg**

APEC tariffs: **http://www.apectariff.org**

Asia Environmental Review: **http://www.asianenviro.com**

Asia Pulse (tenders online -- (password protected): **http://203.63.165.110/Asiapulse/asiapulse.nsf**

Asian Development Bank: **http://www.adb.org**

Beijing Municipal Government Site: **http://www.beijing.gov.cn**

Beijing Investment Guide: **http://www.tradepoint.com.cn**

Beijing Scene: **http://www.beijingscene.com**

China Agenda 21: **http://www.acca21.edu.cn**

China Business Net: **http://www.ccpit.org**

China Business News: **http://www.chinavista.com/business/news/home.html**

China Council for the Promotion of International Trade: **http://www.ccpit.org**

China Economic Information Network: **http://www.cei.gov.cn**

China Environmental Protection (CEP): **http://www.sepaeic.gov.cn/english/index.htm**

China On-Line: **http://www.aslannet.com/china/china**

China Public Procurement and Bidding: **http://www.chinabidding.gov.cn/indexe.html**

China Vista: **http://chinavista.com**

ChinaMarket (Ministry of Foreign Trade and Economic Co-operation): **http://www.chinamarket.com.cn**

ChinaMet.com: **http://www.chinamet.com/echinamet/index.asp**

Chinese Government On-line: **http://www.gov.cn**

Chongqing Chamber of Commerce: **http://www.boom.com.cn**

Chongqing Municipal Government: **http://www.cq.gov.cn**

Chongqing On-line: **http://www.online.cq.cn**

Dalian Investment Guide: **http://www.china-dalian.com**

Dalian Municipal Government: **http://www.dalian-gov.net**

Environmental Economics and Policy Network for China (EEPNET):
http://www.chinaenvironment.net/eepnet/index.html

Global Environment Fund: **http://www.globalenvironmentfund.com**

Guide to Life and Business in Beijing: **http://www.chinanow.com**

Hangzhou Municipal Government: **http://www.hangzhou.gov.cn**

Heilongjiang On-line: **http://www.hl.cninfo.net**

Investment in Liaoning: **http://www.china-liaoning.org**

Lianyungang: **http://www.lyg.gov.cn**

Ministry of Finance: **http://www.mof.gov.cn**

Ministry of Foreign Trade and Economic Cooperation: **http://www.moftec.gov.cn**

Nanjing Municipal Government: **http://www.nanjing.gov.cn**

The Organization for Economic Co-operation and Development (OECD): **http://www.oecd.org**

People's Republic of China Embassy in Ottawa: **http://www.chinaembassycanada.org**

Professional Association for China's Environment (PACE): **http://www.chinaenvironment.net**

Qingdao Information: **http://qdcityinfo.com**

Qingdao Today: **http://www.qingdaotoday.com**

The Shanghai Guide: **http://www.shanghaiguide.com**

Shanghai Information (general): **http://www.sh.com**

Shanghai Information (Guide to Life and Business in Shanghai): **http://www.chinanow.com**

Shenyang Economic & Development Trade Zone: **http://www.sydz.gov.cn**

Sichuan Chamber of Commerce: **http://www.scgcc.com**

Sichuan On-line: **http://www. scsti.ac.cn**

SinoSource (Internet-based business information provider): **http://www.sinosource.com**

Skali (Asian procurement): **http://www. skali.com.my/business/ten**

State Council Information Office: **http://www.china.org.cn**

State Council Special Economic Zones Office: **http://www.sezo.gov.cn**

Three Gorge Project On-line: **http://www.china3gorges.com**

Tianjin Economic-Technological Development Area: **http://www.teda.gov.cn**

Trade and Environment Industry Database:
http://www.american.edu/projects/mandala/TED/hp24.htm

United Nations Environment Program - Global Resource Information Database: **http://www.gridw.pl**

United States China Business Council: **http://www.uschina.org**

Wenzhou Municipal Government: **http://www.chinawenzhou.com**

Window on China: **http://www.china-window.com**

Window on Shandong: **http://www.shandong-window.com**

World Bank (International Bank for Reconstruction and Development – IBRD):
http://www.worldbank.org/html/extdr/backgrd/ibrd
China Country Office: **http://www.worldbank.org.cn/English/home.asp**
Montreal Protocol Projects in China:
http://www.worldbank.org.cn/English/IBRD/MPProject.shtml
Global Environment Facility Projects in China:
http://www.worldbank.org.cn/English/IBRD/GEFProject.asp

Zhejiang Provincial Government: **http://www.zhejiang.gov.cn**

The Web sites of the municipal governments of the following cities can be located at **http://www.*[replace with city name]*.gov.cn**: Bengbu, Chuzhou, Huainan, Hefei, Ma'anshan, Nantong, Qidong, Rudong, Taicang, Taizhou, Tongzhou, Wuzi, Yangzhou.

BIBLIOGRAPHY

Asian Development Bank. *Asia Least-cost Greenhouse Gas Abatement Strategy: People's Republic of China*, October 1998.

Associated Press. *China to Relocate 230,000 from Chongqing by June, 2003* , August 13, 2000.

Canadian International Development Agency. *China Country Development Policy Framework* , June 11, 1998.

———. *List of Bilateral Projects in China as of March 2000*, downloaded from http://CIDA71.acdi-cida.gc.ca/cida_ind.nsf/vLUallDocByIDEn/8BE215436FE47C95852568AB006A7FCC?OpenDocument on August 17, 2000.

China Daily. *China to Change Water Law* , August 25, 2000.

Department of Foreign Affairs and International Trade. *China and Hong Kong Trade Action Plan 2000* , 2000.

———. *Focus on China Regions: Bohai Rim* , 2000.

———. *Focus on China Regions: Northeast China* , 2000.

———. *Focus on China Regions: Southwest China*, 2000.

———. *Focus on China Regions: Yangtze Delta* , 2000.

Environment Canada. *Compendium of Export and Financial Assistance Providers for the Canadian Environmental Industry*, 1999.

Euromoney Publications. *Deals of the Year, Asia, Africa, Middle East, Asia - Water Deal of the Year: Chengdu No. 6*, January 10, 2000.

Stover, Jim. "Hazardous Waste Management in China," *Sinosphere*, Vol. 3, Issue 1, Winter 2000.

U.S. & Foreign Commercial Service and U.S. Department of State. *China: Industrial Air Pollution Control Equipment*, June 1, 1998.

———. *China: Renewable Energy*, June 1, 2000.

———. *China: Solid Waste Management Technologies* , July 1, 1999.

———. *China: Vehicle Emissions Control Technology* , January 1, 1999.

———. *China: Wastewater Treatment Technologies* , June 1, 1998.

———. *China: Water Treatment and Supply* , June 1, 1998.

World Reporter. *China's Anhui Province Suffering Severe Drought* , August 12, 2000.

———. *Headway in cleaning up China's Most Polluted River* , August 20, 2000.

Appendix A. - Business Do's and Don'ts

Do:

- familiarize yourself with China's culture, politics, business and social practices;
- understand that respect — amply seasoned with a knowledge and understanding of the Chinese culture — will be a critical building block in the foundation of a commercial relationship;
- understand the full meaning of *guanxi*, as well as the Chinese philosophy of "friendship first, business second";
- enlist the assistance of the Government of Canada through its various departments, offices, Consulates General and the Canadian Embassy in Beijing;
- take advantage of Government-supported trade initiatives, e.g. Team Canada visits;
- become familiar with Canadian public policies and public- and private-sector initiatives designed to provide a competitive advantage to Canadian companies;
- be aware, if your company is an SME, that market access will likely occur more quickly if you are part of a consortium;
- note the advantages inherent in offering attractive financing options;
- become familiar with the advantages/disadvantages afforded by joint ventures with Chinese companies. Wholly owned foreign companies, technology transfer arrangements, trading companies and establishment of local sales offices are also options that require examination;
- recognize the value of early and frequent visits to project sites to meet key contacts and maintain relationships;
- adopt visible marketing and promotion tools — in the appropriate language, i.e., Cantonese, Mandarin, etc. — that inform potential customers of who you are, what you do and how to contact you;
- be aware that thoughtful, targeted marketing can result in your product becoming the "preferred" one;
- note that for most large procurements, pre-qualification of your product will likely be necessary;
- be aware of the increased (spin-off) commercial opportunities that can develop as a result of establishing a presence in China, practising *guanxi*, and expanding your circle of business associates;
- have your agent or advisor research relevant aspects of the opportunity and establish contact with key officials at the project management as well as municipal, provincial and central government levels;
- allow your agent or advisor to advise you on, and facilitate, meetings and subsequent negotiations;

- instruct your agent or advisor to keep you apprized of the trading practices in China of other foreign exporters; and

- recognize that major contracts are often lost over minor misunderstandings. Rely on your agent's or advisor's knowledge and never "infer" or "assume" what terms mean or what type of response is required to a communication.

Do Not:

- visit China on a speculative, unassisted basis; and

- assume that corrupt officials control regional markets because new laws are not being policed. New laws are not implemented overnight but the changes *are* being made!

READER EVALUATION

Please help the Market Research Centre to produce market reports which meet your information needs by completing this evaluation form and returning it by fax (613) 943-1103. Thank you for your valuable input.

1. How did you obtain a copy of this market report?
   - ☐ InfoCentre FaxLink system
   - ☐ InfoCentre help line
   - ☐ Local government office
   - ☐ Government Internet site
   - ☐ Other: _____

2. How would you describe this market report?

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
Useful	☐	☐	☐	☐	☐
Complete	☐	☐	☐	☐	☐
Well organized	☐	☐	☐	☐	☐
Well written	☐	☐	☐	☐	☐
Ideal length	☐	☐	☐	☐	☐

3. In what form do you prefer to obtain these reports?
   - ☐ Print
   - ☐ Electronic

4. Based on the information in this report, what specific action(s) does your organization plan to take in this market? Check all that apply.
   - ☐ Seek an agent/distributor
   - ☐ Visit the market
   - ☐ Do more research
   - ☐ Other: _____
   - ☐ Contact Canadian trade office abroad
   - ☐ Participate in a trade show abroad
   - ☐ Nothing

5. What other market reports would be of benefit to your organization? Please identify specific products and countries. _____

6. Which of the following categories best describes your organization? Check one only.
   - ☐ Processor/manufacturer
   - ☐ Trading house
   - ☐ Export service provider
   - ☐ Industry/trade association
   - ☐ Government
   - ☐ Student/academia
   - ☐ Consultant
   - ☐ Other: _____

7. What were your organization's total sales last year, in Canadian dollars?
   - ☐ Less than $10 million
   - ☐ More than $50 million
   - ☐ $10 million to $50 million
   - ☐ Not applicable

Additional comments/suggestions for improvement: _____

OPTIONAL — The name of your organization is: _____